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Apple and Crabapple Insects

Homeowners and small producers can produce useable apples in South Carolina with minimal insect damage if they are aware of the potential pest problems. Some insecticide applications may be necessary even under the best of conditions. The primary pests of apples will be discussed based on the part of the tree that is attacked.

Pests Attacking the Leaves

There are several pests or groups of pests that feed on apple leaves. Most of these cause little real damage to the tree and are often best left alone. There are many natural enemies that feed on these pests.

Aphids are a fairly common problem on apples. There are two major kinds that can build up to fairly high numbers during the summer. These are the green apple aphid and the spirea aphid. Both of these aphids have green bodies (Fig. 1). The adult aphids may have wings or be wingless. Aphids are common on the tender young leaves on branch tips and on watersprouts. While feeding, the aphids produce honeydew. This is a liquid rich in sugars. Black sooty mold often grows on the honeydew. Aphids have many generations a season.

Figure 1. Aphids feeding on the underside of an apple leaf.

Photo Credit: C.S. Gorsuch, Clemson Univ. Entomology Dept.

Aphids are attacked by lady beetles, syrphid fly larvae and other predators and parasites. In many cases, these beneficial insects may keep the aphids under control if insecticide treatments are avoided.

Two-spotted spider mites and European red mites can be a serious pest of apples. If mite populations are high, the feeding activity can reduce the quality of the current crop and reduce flower bud set for the following year. While both mites produce the same type of damage (Fig. 2), there are some significant differences.

Two-spotted spider mites spend the winter as mature females hiding in protected places on the ground near the tree. In the spring, they begin feeding on the vegetation under the tree. Later, they move up into the tree and begin to feed on the apple leaves.

Figure 2. Mite feeding damage (top leaf) and an undamaged leaf (bottom).

Photo Credit: C.S. Gorsuch, Clemson Univ. Entomology Dept.

European red mites spend the winter in the egg stage. The eggs are laid on the tips of the twigs around the rough bud scars. When numbers are high, the twigs will have a reddish appearance. The mites remain in the tree throughout the season.

Both mites have several generations a season. None of the controls available for homeowners kill the egg stage. This makes multiple applications of miticide necessary. Since mites can go from egg to an adult ready to lay more eggs in about a week, the second application should be made in seven to 10 days.

The Japanese beetle adults feed on the leaves during June and July. The beetles feed on the soft leaf tissue and leave the leaf veins. This gives damaged leaves a lacy appearance (Fig. 3). Occasionally, they may feed on damaged fruit. However, repeated use of some insecticides may cause mite populations to explode. Because of this, it is best to leave the adult beetles alone in most cases. Traps may be used to suppress Japanese beetles, but the traps must be placed at least 30 feet away from the plants to be protected. The traps will draw

Figure 3. Japanese beetle feeding damage on a leaf. Note the lacy appearance.

Photo Credit: C.S. Gorsuch, Clemson Univ. Entomology Dept.

in adult beetles. If the trap is too close to the plant to be protected, the beetles may stop and feed for a while before entering the trap.

There are a number of leafrollers that feed on apple leaves. The biggest problem with leafrollers is that sometimes they will tie the leaves to the fruit and feed on both the surface of the fruit and on the leaves (Fig 4). There are a number of predators and parasites that feed on the leafroller caterpillars. If an insecticide treatment is needed, one of the B.t. materials, such as Dipel, will not harm the natural enemies of the leafrollers and will kill the young caterpillars.

Figure 4. Leafroller feeding damage to an apple.

Photo Credit: C.S. Gorsuch, Clemson Univ. Entomology Dept.

The spotted tentiform leafminer is an occasional pest on apple trees. Usually, the worst damage is found on trees that have been heavily sprayed.

The young leafminer caterpillars feed inside the leaf. At first they feed on the sap present in the leaf. Later, they feed on the leaf tissue. This causes the leaf to pucker giving the upper leaf surface a tent-like appearance (Fig. 5). Heavy mining damage can reduce the quality of the current year's crop and reduce flower bud set for the following year. There are two very efficient parasites of this pest. Usually, the parasites keep the leafminers in check.

Figure 5. Spotted tentiform leafmine adult and mines on apple leaves.

Photo Credit: C.S. Gorsuch, Clemson Univ. Entomology Dept.

Pests Attacking the Fruit

The proverbial wormy apple probably has the immature of the codling moth in it. This is the number one apple pest in the world. The mature caterpillars (larvae) leave the apples in the fall and spin a silk shelter under loose bark. They spend the winter in this shelter. In the spring, they change to the adult moth. The moths emerge shortly after bloom and lay eggs on leaves near fruit clusters. The larvae enter the young fruit at the calyx end where the petals were attached. Another generation of moths occurs in July. These moths lay eggs directly on the surface of the fruit. Again, the larvae burrow to the core of the fruit and feed (Fig. 6). A third generation occurs in August.

Figure 6. A codling moth larva feeding in the apple core.

Insecticide treatments must be directed toward the adult moths or the newly hatched larvae. Once the larvae enter the apples they are totally protected. Parasites and predators feed on the eggs and larvae.

Tarnished plant bugs and stink bugs will both feed on the young fruit. As the bugs penetrate the fruit with their needle-like mouthparts they inject a saliva that kills the plant cells around the puncture. They then suck the juices from the fruit. As the fruit continues to grow, depressed areas (catfacing) appear around the feeding sites (Fig. 7). Homeowners do not have good insecticides available for controlling these pests. Keeping early blooming weeds cut in the area where the apple trees are growing reduces the number of plant bugs.

Figure 7. Typical "catfacing" damage caused by plant bug feeding.

Photo Credit: C.S. Gorsuch, Clemson Univ. Entomology Dept.

The plum curculio is a native weevil that may attack apple fruit. The adult weevils spend the winter in protected areas near the apple trees. They return to the trees in the spring after three or four days when the temperature is above 70°F. After petal fall, the female weevil will make a crescent shaped cut through the fruit skin and insert an egg under the flap. Usually, the larva will be killed by the rapidly growing fruit. The scar will show up at harvest. If the fruit becomes infested it will be misshapen and often will drop to the ground. Insecticide sprays immediately after bloom may reduce plum curculio damage. Removal

of wild plum in the area and practicing sanitation around the apple trees will reduce the problem.

Pests Attacking the Branches, Trunk, and Roots

One of the most important pests of the branches is the San Jose scale. The adult scale insect is about 0.1 inch in diameter. It has a grey cover that hides the insects. Scale insects have thread-like mouthparts that are inserted into the bark. They feed on the sap. There are four generations a year in South Carolina.

A single female scale can produce about 400 young over a 6-week period. The young are called crawlers and move to a new area. They then settle down, insert their mouthparts, begin to feed, and secrete the covering over their body. When populations are high, the crawlers may settle on the fruit. This produces a red measles-like spot on the ripe fruit (Fig. 8). Heavy scale infestations can kill individual branches. The best control for scales insects is a good application of dormant oil in the spring. This should be applied before the leaf buds begin to open. During the season, insecticide sprays will kill the crawlers. Insecticide sprays will not kill the scales once the cover is secreted.

Figure 8. Scale damage on a mature apple.

Photo Credit: C.S. Gorsuch, Clemson Univ. Entomology Dept.

Usually aphids are considered a pest of the leaves. The woolly apple aphid feeds on the bark of small twigs, around pruning cuts, and also on the roots of apple trees. The feeding causes the tree to form knobby galls. This can occur on twigs and on the roots. Heavy damage can reduce the vigor of the tree.

Woolly aphids are covered with a mass of long wax filaments. This gives them their common name.

The above ground forms can be controlled with insecticide sprays. These should be applied whenever colonies of the aphids are present. Root feeding colonies cannot be controlled.

Apple trees that are under stress from planting, drought, or other causes may be attacked by the flatheaded appletree borer. This borer is found primarily on young trees. The adult beetles are about ½ inch long, somewhat flattened, and vary from dark metallic brown to dull gray. The larvae are legless, yellow to yellowish white in color, and have a broad, flattened area of the body immediately behind the head. Mature larvae are 1½ inches long.

The larvae damage the trees by boring in trunk and main branches. The galleries will be filled with sawdust-like frass or excrement. Infested trees will often have cracks in the bark that ooze sap. Initial attacks are usually on the sunny side of the tree. Eventually the galleries can girdle the tree and cause death of the tree.

Adult beetles are present from late spring to November. There is one generation a year.

Vigorous trees will often produce enough sap to drown the larvae in the galleries. The only good control is to keep the trees healthy and vigorous.

Occasionally, apple trees will go into a slow decline. Close examination of the roots will show the damage from Prionus root borers (Fig. 9). These borers may attack week trees, but may attack young trees that are planted in an area that was recently cleared of hardwood trees. The larvae of this borer can survive for several years feeding on dead roots. Since the life cycle of this pest is at least five years, the larvae grow to a very large size. Mature larvae may be as large as a man's finger. There is no control for this pest.

Figure 9. An apple root damaged by the Prionus root borer.

Photo Credit: C.S. Gorsuch, Clemson Univ. Entomology Dept.

Check with your local County Extension Agent for specific control recommendations.

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